What is claimed is:

1. An optical transmission path monitoring system for monitoring optical transmission paths by wavelength-division multiplexing probe lights with signal lights of a wavelength division multiplexing optical transmission system provided with:

an optical fiber monitoring probe light for monitoring optical fibers which constitute some parts of said optical transmission paths, and

an optical amplifier-repeater monitoring probe light for monitoring optical amplifier-repeaters which constitute other parts of said optical transmission paths.

2. The optical transmission path monitoring system, as claimed in Claim 1, wherein:

the wavelength of said optical fiber monitoring probe light is such a wavelength as makes the wavelength dispersion of group delays over the full length of said optical transmission paths negative, and

the wavelength of said optical amplifier-repeater monitoring probe light is such a wavelength as makes the wavelength dispersion of said group delays over the full length of the optical transmission paths positive.

3. The optical transmission path monitoring system, as claimed in Claim 1, wherein:

said optical transmission paths have a zero dispersion

wavelength which makes the wavelength dispersion of group delays over the full length of said optical transmission paths zero,

the wavelength of said optical fiber monitoring probe light is on the shorter wavelength side than said zero dispersion wavelength, and

the wavelength of said optical amplifier-repeater monitoring probe light is on the longer wavelength side than said zero dispersion wavelength.

4. The optical transmission path monitoring system, as claimed in Claim 1, wherein:

said wavelength division multiplexing optical transmission system has two-core two-way optical transmission paths, and is provided with a total of four probe lights including said optical fiber monitoring probe light and said optical amplifier-repeater monitoring probe light for delivering to each of the two outward optical transmission paths which said two-core two-way optical transmission paths have, and

every one of said four probe lights has a different wavelength from the others.

5. The optical transmission path monitoring system, as claimed in Claim 4, provided with:

probe light generating means for generating said optical fiber monitoring probe lights and optical amplifier-repeater monitoring probe lights,

multiplexing means for multiplexing said probe lights

with signal lights and delivering the multiplexed lights to said outward optical transmission path,

loop back means for branching reflected light components generating from said probe lights from said outward optical transmission path and coupling the branched lights with signal lights on said inward optical transmission path, and

optical detecting means for detecting said light components transmitted by said loop back means and outputted from said inward optical transmission path, wherein:

said optical transmission paths are monitored on the basis of the output of said optical detecting means.

6. The optical transmission path monitoring system, as claimed in Claim 5, wherein:

said optical detecting means optically detects by a coherent light detecting system said light components transmitted by said loop back means and outputted from said inward optical transmission path.

7. The optical transmission path monitoring system, as claimed in Claim 6, wherein:

said coherent light detecting system is an optical homodyne detection system using said optical fiber monitoring probe light from said inward optical transmission path as receive light and a light partially branched from said optical fiber monitoring probe light from said probe light generating means as local oscillating light.

8. The optical transmission path monitoring system, as claimed in Claim 5, wherein:

said optical detecting means optically detects by a direct light detecting system said light components transmitted by said loop back means and outputted from said inward optical transmission path.

9. The optical transmission path monitoring system, as claimed in Claim 5, wherein:

said loop back means is provided with two 2×2 optical couplers inserted into said optical transmission paths and mutually connected by one each of optical terminals.

10. The optical transmission path monitoring system, as claimed in Claim 9, wherein:

said 2×2 optical couplers are provided with light reflecting means for selectively reflecting said optical amplifier-repeater monitoring probe lights.

11. The optical transmission path monitoring system, as claimed in Claim 5, further provided with:

means for alternatively selecting said optical fiber monitoring probe lights and optical amplifier-repeater monitoring probe lights for supply to said outward optical transmission path, and monitoring the optical fibers and the optical amplifier-repeaters on a time-division basis.

12. An optical transmission path monitoring apparatus for monitoring optical transmission paths by wavelength-division multiplexing probe lights with signal lights of a wavelength division multiplexing optical transmission system provided with:

probe light generating means for emitting said probe lights,

multiplexing means for multiplexing said probe lights with signal lights and delivering the multiplexed lights to an outward optical transmission path of the optical transmission paths provided with said outward optical transmission path for transmitting signal lights, an inward optical transmission path for receiving signal lights, and loop back means for looping back between said two optical transmission paths, and

optical detecting means detecting light components transmitted by said loop back means and outputted from said inward optical transmission path, wherein:

said optical transmission paths are monitored on the basis of the output of said optical detecting means.

13. The optical transmission path monitoring apparatus, as claimed in Claim 12, wherein said probe lights comprise:

an optical fiber monitoring probe light for monitoring optical fibers which constitute some parts of said optical transmission paths, and

an optical amplifier-repeater monitoring probe light for

monitoring optical amplifier-repeaters which constitute other parts of said optical transmission paths.

14. The optical transmission path monitoring apparatus, as claimed in Claim 13, wherein:

the wavelength of said optical fiber monitoring probe light is such a wavelength as makes the wavelength dispersion of group delays over the full length of said optical transmission paths negative, and

the wavelength of said optical amplifier-repeater monitoring probe light is such a wavelength as makes the wavelength dispersion of said group delays over the full length of the optical transmission paths positive.

15. The optical transmission path monitoring apparatus, as claimed in Claim 13, wherein:

the wavelength of said optical fiber monitoring probe light is on the shorter wavelength side than a zero dispersion wavelength which makes the wavelength dispersion of group delays over the full length of said optical transmission paths zero, and

the wavelength of said optical amplifier-repeater monitoring probe light is on the longer wavelength side than said zero dispersion wavelength.

16. The optical transmission path monitoring apparatus, as claimed in Claim 13, wherein:

said wavelength division multiplexing optical transmission system has two-core two-way optical transmission paths, said optical transmission path monitoring apparatuses being provided opposite each other, and is provided with a total of four probe lights including said optical fiber monitoring probe light and said optical amplifier-repeater monitoring probe light for delivering to each of the two outward optical transmission paths which said two-core two-way optical transmission paths have, and

every one of said four probe lights has a different wavelength from the others.

17. The optical transmission path monitoring apparatus, as claimed in Claim 12, wherein:

said optical detecting means optically detects by a coherent light detecting system light components transmitted by said loop back means and outputted from said inward optical transmission path.

18. The optical transmission path monitoring apparatus, as claimed in Claim 17, wherein:

said coherent light detecting system is an optical homodyne detection system using said optical fiber monitoring probe light from said inward optical transmission path as receive light and a light partially branched from said optical fiber monitoring probe light from said probe light generating means as local oscillating light.

19. The optical transmission path monitoring apparatus, as claimed in Claim 12, wherein:

said optical detecting means optically detects by a direct light detecting system said light components transmitted by said loop back means and outputted from said inward optical transmission path.

20. The optical transmission path monitoring apparatus, as claimed in Claim 12, wherein:

said loop back means is provided with two 2×2 optical couplers inserted into said optical transmission paths and mutually connected by one each of optical terminals.

21. The optical transmission path monitoring apparatus, as claimed in Claim 12, wherein:

said 2×2 optical couplers are provided with light reflecting means for selectively reflecting said optical amplifier-repeater monitoring probe lights.

22. The optical transmission path monitoring apparatus, as claimed in Claim 12, further provided with:

means for alternatively selecting said optical fiber monitoring probe lights and optical amplifier-repeater monitoring probe lights for supply to said outward optical transmission path, and monitoring the optical fibers and the optical amplifier-repeaters on a time-division basis.

23. An optical transmission path monitoring method for monitoring optical transmission paths by wavelength-division multiplexing probe lights with signal lights of a wavelength division multiplexing optical transmission system using:

an optical fiber monitoring probe light for monitoring optical fibers which constitute some parts of said optical transmission paths, and

an optical amplifier-repeater monitoring probe light for monitoring optical amplifier-repeaters which constitute other parts of said optical transmission paths.

24. The optical transmission path monitoring method, as claimed in Claim 23, wherein:

the wavelength of said optical fiber monitoring probe light is such a wavelength as makes the wavelength dispersion of group delays over the full length of said optical transmission paths negative, and

the wavelength of said optical amplifier-repeater monitoring probe light is such a wavelength as makes the wavelength dispersion of said group delays over the full length of the optical transmission paths positive.

25. The optical transmission path monitoring method, as claimed in Claim 23, wherein:

said optical transmission path has a zero dispersion wavelength which makes the wavelength dispersion of group delays

over the full length of said optical transmission paths zero,

the wavelength of said optical fiber monitoring probe light is on the shorter wavelength side than said zero dispersion wavelength, and

the wavelength of said optical amplifier-repeater monitoring probe light is on the longer wavelength side than said zero dispersion wavelength.

26. The optical transmission path monitoring method, as claimed in Claim 23, wherein:

said wavelength division multiplexing optical transmission system has two-core two-way optical transmission paths, and is provided with a total of four probe lights including said optical fiber monitoring probe light and said optical amplifier-repeater monitoring probe light for delivering to each of the two outward optical transmission paths which said two-core two-way optical transmission paths have, and

every one of said four probe lights has a different wavelength from the others.

27. The optical transmission path monitoring method, as claimed in Claim 26, comprising:

a step of generating said optical fiber monitoring probe lights and optical amplifier-repeater monitoring probe lights,

a step of multiplexing said probe lights with signal lights and delivering the multiplexed lights to said outward optical transmission path, and

a step of detecting said light components outputted from said inward optical transmission path by branching reflected light components generating from said probe lights from said outward optical transmission path and looping back the branched lights onto said inward optical transmission path, whereby:

said optical transmission paths are monitored on the basis of the output of said optical detecting means.

28. The optical transmission path monitoring method, as claimed in Claim 27, whereby:

said light components outputted from said inward optical transmission path are detected by a coherent light detecting system at said step of detecting light components.

29. The optical transmission path monitoring method, as claimed in Claim 28, whereby:

said coherent light detecting system is an optical homodyne detection system using said optical fiber monitoring probe light from said inward optical transmission path as receive light and a light partially branched from said optical fiber monitoring probe light from said probe light generating means as local oscillating light.

30. The optical transmission path monitoring method, as claimed in Claim 27, whereby:

said light components transmitted by said loop back means and outputted from said inward optical transmission path are

detected by a direct light detecting system at said step of detecting light components.

31. The optical transmission path monitoring method, as claimed in Claim 27, whereby:

said optical fiber monitoring probe lights and optical amplifier-repeater monitoring probe lights are alternatively selected for supply to said outward optical transmission path, and the optical fibers and the optical amplifier-repeaters are monitored on a time-division basis.